

Tiffany, Bruce

From: Renaud, Rick
Sent: Thursday, May 04, 2006 1:42 PM
To: Johnson, Scott; Stern, Jeff; Tiffany, Bruce
Subject: FW: JH28 NBF PCB Investigation

Attachments: JH28_NBF-CB_pkg.pdf



JH28_NBF-CB_pkg.
pdf (497 KB)

Total PCBs, mg/kg DW

CB173	29,000
CB174	
CB175	3,200
CB179	34,000
CB182	6,100
CB185	11,000

-----Original Message-----

From: Cargill, Dan (ECY) [mailto:DACA461@ECY.WA.GOV]
Sent: Thursday, May 04, 2006 1:25 PM
To: Renaud, Rick
Subject: FW: JH28 NBF PCB Investigation

FYI

Dan
425-649-7023

-----Original Message-----

From: Bach, Carl M [mailto:carl.m.bach@boeing.com]
Sent: Thursday, May 04, 2006 11:43 AM
To: Cargill, Dan (ECY)
Cc: Kris Hendrickson; Joe Kalmar; Power, Raymond T; McCormack, Daniel C
Subject: FW: JH28 NBF PCB Investigation

Dan,

Here are the results from our recent sampling of the lines leading to CB 173. I have also provided a brief summary of the sample locations and observations.

Samples were collected from the base of CB 182 and CB 185 (the catch basins with insert filter fabric near the Steam Plant). The results were similar to the results from the samples collected from the filter material, indicating that fine soil particulate may be passing through these filters.

A solids sample was collected from a 6-inch concrete pipe entering CB 179. This pipe is not shown on the Boeing storm drain map. However, this pipe enters CB 179 from the north (parallel to the fence line).

At CB 173 one sample was obtained from the pipe leading from CB 174. The sample from this pipe is labeled as CB 173. An accumulation of dark fine sand had collected in this pipe. There appears to be infiltration of groundwater to this line from an unsealed pipe connection, and the fine sand is likely being transported by that infiltration.

A solids sample was also collected from CB 175 (one of the other three influent sources to CB 173).

Based on these results, it appears that we need to wait until the soil containment project near the fence line is completed. After re-cleaning all of the drain lines leading to CB 173, we will need to collect more samples to determine if PCBs are being transported in this system via other pathways.

Please call or email me if you have any questions.

Thanks

Carl Bach
206-898-0438

-----Original Message-----

From: Stephanie Lucas [mailto:steph@arilabs.com]
Sent: Tuesday, May 02, 2006 5:11 PM
To: Bach, Carl M; Joe Kalmar
Cc: Anne Halvorsen; Kris Hendrickson
Subject: JH28 NBF PCB Investigation

Attached is the final report for the PCB samples received last week.
Please note that we are changing the format of our Form II's, as new control limits took effect today. As there were two levels of extractions, there are two sets of reporting limits. I'm still getting used to it, so feel free to contact me if you are confused.

Stephanie Lucas
Analytical Resources, Inc
(206) 695-6213 - direct
(206) 695-6201 - fax

Visit us at www.arilabs.com for analyses and pricing information.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

May 2, 2006

Joe Kalmar
Landau Associates, Inc.
130 Second Ave
Edmonds, WA 98020

RE: Project: NBF PCB Investigation / 025082
ARI Job: JH28

Dear Joe:

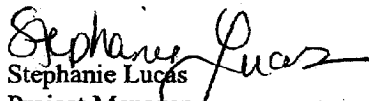
Please find enclosed a faxed copy of the chain of custody (COC) records and analytical results for the above referenced project. Analytical Resources, Inc. accepted three samples on April 26, 2006. The samples were received at a cooler temperature of 11.5°C.

The samples were analyzed for PCB, as requested on the COC. Due to limited volume, sample **CB-179-060426** was centrifuged. The water was decanted out of all other samples prior to extraction. The samples were prescreened, extracted and analyzed for PCBs.

Please refer to the data qualifiers sheet for analyte flag definitions. No analytical complications were noted.

Quality control analysis results are included for your review. Copies of the reports and all associated raw data will be kept on file electronically at ARI. If you have any questions or require additional information, please contact me at your convenience.


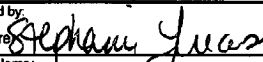
Sincerely,
ANALYTICAL RESOURCES, INC


Stephanie Lucas
Project Manager
(206) 695-6213
steph@arilabs.com
www.arilabs.com

Enclosures

cc: Carl Bach, The Boeing Company, P.O. Box 3707, M/S 1W-12, Seattle, WA 98124-2207

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 51428		Turn-around Requested: Standard		Page: 1 of 1																			
ARI Client Company: Landa Associates		Phone: 425-778-0907		Date: 4/26/06	Ice Present? YES																		
Client Contact: Joe Kalman		No. of Coolers: 1		Cooler Temps: 11.5°																			
Client Project Name: NBF-PCB investigation		<table border="1"> <thead> <tr> <th colspan="8">Analysis Requested</th> <th>Notes/Comments</th> </tr> </thead> <tbody> <tr> <td>PCBs</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Analysis Requested								Notes/Comments	PCBs								
Analysis Requested								Notes/Comments															
PCBs																							
Client Project #: 025082		Samplers: Nathan Maxley/Mario Lopez																					
Sample ID	Date	Time	Matrix	No. Containers																			
CB-185-060426	4/26	0830	Solids	2	X																		
CB-192-060426		0845	↓	2	X																		
CB-179-060426		0915	↓	1	X						centrifuge												
CB-173-060426		1030	↓	2	X																		
CB-175-060426		1106	↓	2	X																		
Comments/Special Instructions		Relinquished by: 		Received by: 		Relinquished by:		Received by:															
		(Signature)		(Signature)		(Signature)		(Signature)															
		Printed Name: Mario Lopez		Printed Name: Stephanie Lucas		Printed Name:		Printed Name:															
		Company: Landa		Company: ARI		Company:		Company:															
Date & Time: 4/26/06 1145		Date & Time: 4/26/06 1145		Date & Time:		Date & Time:																	



Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)


Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: CB-185-060426
SAMPLE

Lab Sample ID: JH28A
LIMS ID: 06-6981
Matrix: Solid
Data Release Authorized: 
Reported: 05/02/06

QC Report No: JH28-The Boeing Company
Project: NBF-PCB Investigation
025082
Date Sampled: 04/26/06
Date Received: 04/26/06

Date Extracted: 05/01/06
Date Analyzed: 05/02/06 10:50
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 0.35 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 6.8
Percent Moisture: 82.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	1,100	< 1,100 U
53469-21-9	Aroclor 1242	1,100	< 1,100 U
12672-29-6	Aroclor 1248	1,700	< 1,700 Y
11097-69-1	Aroclor 1254	1,100	11,000
11096-82-5	Aroclor 1260	1,700	< 1,700 Y
11104-28-2	Aroclor 1221	1,100	< 1,100 U
11141-16-5	Aroclor 1232	1,100	< 1,100 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	96.0%
Tetrachlorometaxylene	88.2%

FORM I

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: CB-182-060426
SAMPLE

Lab Sample ID: JH28B
LIMS ID: 06-6982
Matrix: Solid
Data Release Authorized:
Reported: 05/02/06

QC Report No: JH28-The Boeing Company
Project: NBF-PCB Investigation
025082
Date Sampled: 04/26/06
Date Received: 04/26/06

Date Extracted: 05/01/06
Date Analyzed: 05/02/06 11:08
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.1 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: 7.0
Percent Moisture: 86.4%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	260	< 260 Y
53469-21-9	Aroclor 1242	160	< 160 Y
12672-29-6	Aroclor 1248	660	< 660 Y
11097-69-1	Aroclor 1254	33	5,900 E
11096-82-5	Aroclor 1260	660	< 660 Y
11104-28-2	Aroclor 1221	66	< 66 Y
11141-16-5	Aroclor 1232	99	< 99 Y

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	72.5%
Tetrachlorometaxylene	77.8%

FORM I

KCSlip4 57065

SEA423371

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED


Sample ID: CB-182-060426

DILUTION

Lab Sample ID: JH28B

LIMS ID: 06-6982

Matrix: Solid

Data Release Authorized: 

Reported: 05/02/06

QC Report No: JH28-The Boeing Company

Project: NBF-PCB Investigation

025082

Date Sampled: 04/26/06

Date Received: 04/26/06

Date Extracted: 05/01/06

Date Analyzed: 05/02/06 11:43

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 12.1 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 50.0

Silica Gel: No

pH: 7.0

Percent Moisture: 86.4%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	1,600	< 1,600 U
53469-21-9	Aroclor 1242	1,600	< 1,600 U
12672-29-6	Aroclor 1248	1,600	< 1,600 U
11097-69-1	Aroclor 1254	1,600	6,100
11096-82-5	Aroclor 1260	1,600	< 1,600 U
11104-28-2	Aroclor 1221	1,600	< 1,600 U
11141-16-5	Aroclor 1232	1,600	< 1,600 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

FORM I

KCSlip4 57066

SEA423372

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: CB-179-060426
SAMPLE

Lab Sample ID: JH28C
LIMS ID: 06-6983
Matrix: Solid
Data Release Authorized: *AB*
Reported: 05/02/06

QC Report No: JH28-The Boeing Company
Project: NBF-PCB Investigation
025082
Date Sampled: 04/26/06
Date Received: 04/26/06

Date Extracted: 05/01/06
Date Analyzed: 05/01/06 14:58
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 0.68 g-dry-wt
Final Extract Volume: 40 mL
Dilution Factor: 2.00
Silica Gel: No
pH: 7.2
Percent Moisture: 33.3%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	12,000	< 12,000 U
53469-21-9	Aroclor 1242	12,000	< 12,000 U
12672-29-6	Aroclor 1248	12,000	< 12,000 U
11097-69-1	Aroclor 1254	12,000	34,000
11096-82-5	Aroclor 1260	12,000	< 12,000 U
11104-28-2	Aroclor 1221	12,000	< 12,000 U
11141-16-5	Aroclor 1232	12,000	< 12,000 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	116%
Tetrachlorometaxylene	112%

FORM I

KCSlip4 57067

SEA423373

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: CB-173-060426
SAMPLE

Lab Sample ID: JH28D

LIMS ID: 06-6984

Matrix: Solid

Data Release Authorized:

Reported: 05/02/06

QC Report No: JH28-The Boeing Company

Project: NBF-PCB Investigation

025082

Date Sampled: 04/26/06

Date Received: 04/26/06

Date Extracted: 05/01/06

Date Analyzed: 05/01/06 15:16

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 0.79 g-dry-wt

Final Extract Volume: 40 mL

Dilution Factor: 2.00

Silica Gel: No

pH: 6.8

Percent Moisture: 23.7%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	10,000	< 10,000 U
53469-21-9	Aroclor 1242	10,000	< 10,000 U
12672-29-6	Aroclor 1248	10,000	14,000
11097-69-1	Aroclor 1254	10,000	15,000
11096-82-5	Aroclor 1260	10,000	< 10,000 U
11104-28-2	Aroclor 1221	10,000	< 10,000 U
11141-16-5	Aroclor 1232	10,000	< 10,000 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	117%
Tetrachlorometaxylene	114%

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED


Sample ID: CB-175-060426

SAMPLE

Lab Sample ID: JH28E

LIMS ID: 06-6985

Matrix: Solid

Data Release Authorized: 

Reported: 05/02/06

QC Report No: JH28-The Boeing Company

Project: NBF-PCB Investigation

025082

Date Sampled: 04/26/06

Date Received: 04/26/06

Date Extracted: 05/01/06

Date Analyzed: 05/02/06 11:26

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 0.77 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Silica Gel: No

pH: 6.4

Percent Moisture: 62.9%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	520	< 520 U
53469-21-9	Aroclor 1242	520	< 520 U
12672-29-6	Aroclor 1248	520	1,100
11097-69-1	Aroclor 1254	520	2,100
11096-82-5	Aroclor 1260	520	< 520 U
11104-28-2	Aroclor 1221	520	< 520 U
11141-16-5	Aroclor 1232	520	< 520 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	94.0%
Tetrachlorometaxylene	85.2%

FORM I

KCSlip4 57069

SEA423375

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

ANALYTICAL
RESOURCES
INCORPORATED

Sample ID: MB-050106

METHOD BLANK

Lab Sample ID: MB-050106

LIMS ID: 06-6981

Matrix: Solid

Data Release Authorized:

Reported: 05/02/06

QC Report No: JH28-The Boeing Company

Project: NBF-PCB Investigation

025082

Date Sampled: NA

Date Received: NA

Date Extracted: 05/01/06

Date Analyzed: 05/02/06 10:13

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 12.0 g

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Silica Gel: No

pH: NA

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	33	< 33 U
53469-21-9	Aroclor 1242	33	< 33 U
12672-29-6	Aroclor 1248	33	< 33 U
11097-69-1	Aroclor 1254	33	< 33 U
11096-82-5	Aroclor 1260	33	< 33 U
11104-28-2	Aroclor 1221	33	< 33 U
11141-16-5	Aroclor 1232	33	< 33 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	97.0%
Tetrachlorometaxylene	96.8%

FORM I

KCSlip4 57070

SEA423376

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-050106

METHOD BLANK

Lab Sample ID: MB-050106

LIMS ID: 06-6983

Matrix: Solid

Data Release Authorized: *AS*

Reported: 05/02/06

QC Report No: JH28-The Boeing Company

Project: NBF-PCB Investigation

025082

Date Sampled: NA

Date Received: NA

Date Extracted: 05/01/06

Date Analyzed: 05/01/06 14:22

Instrument/Analyst: ECD5/PK

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 5.00 g

Final Extract Volume: 40 mL

Dilution Factor: 1.00

Silica Gel: No

pH: NA

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U

Reported in $\mu\text{g/kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	120%
Tetrachlorometaxylene	107%

SW8082/PCB SOIL/SEDIMENTS SURROGATE RECOVERY SUMMARY

Matrix: Solid

QC Report No: JH28-The Boeing Company
Project: NBF-PCB Investigation
025082

Client ID	DCBP % REC	DCEP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-050106	97.0%	52-142	96.8%	52-127	0
LCS-050106	96.8%	52-142	97.0%	52-127	0
CB-185-060426	96.0%	50-142	88.2%	50-123	0
CB-182-060426	72.5%	50-142	77.8%	50-123	0
CB-182-060426 DL	D	50-142	D	50-123	0
MB-050106	120%	49-140	107%	30-135	0
LCS-050106	121%	49-140	113%	30-135	0
CB-179-060426	116%	30-164	112%	26-143	0
CB-173-060426	117%	30-164	114%	26-143	0
CB-175-060426	94.0%	50-142	85.2%	50-123	0

Prep Method: SW3550B
Log Number Range: 06-6981 to 06-6985

FORM-II SW8082

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: LCS-050106
LAB CONTROL

Lab Sample ID: LCS-050106
LIMS ID: 06-6983
Matrix: Solid
Data Release Authorized:
Reported: 05/02/06

QC Report No: JH28-The Boeing Company
Project: NBF-PCB Investigation
025082
Date Sampled: NA
Date Received: NA

Date Extracted: 05/01/06
Date Analyzed: 05/01/06 14:40
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 5.00 g-dry-wt
Final Extract Volume: 40 mL
Dilution Factor: 1.00
Silica Gel: No
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	4180	4000	104%
Aroclor 1260	4360	4000	109%

PCB Surrogate Recovery

Decachlorobiphenyl	121%
Tetrachlorometaxylene	113%

Results reported in $\mu\text{g/kg}$ (ppb)

FORM III

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1



Sample ID: LCS-050106
LAB CONTROL

Lab Sample ID: LCS-050106
LIMS ID: 06-6981
Matrix: Solid
Data Release Authorized: *[Signature]*
Reported: 05/02/06

QC Report No: JH28-The Boeing Company
Project: NBF-PCB Investigation
025082
Date Sampled: NA
Date Received: NA

Date Extracted: 05/01/06
Date Analyzed: 05/02/06 10:32
Instrument/Analyst: ECD5/PK
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.0 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Silica Gel: No
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1016	134	167	80.2%
Aroclor 1260	151	167	90.4%

PCB Surrogate Recovery

Decachlorobiphenyl	96.8%
Tetrachlorometaxylene	97.0%

Results reported in $\mu\text{g/kg}$ (ppb)

FORM III

KCSlip4 57074

SEA423380



Data Reporting Qualifiers

Effective 12/28/04

Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but \geq the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is ≤ 5 times the Reporting Limit and the replicate control limit defaults to ± 1 RL instead of the normal 20% RPD

Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- * Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- NR Spiked compound recovery is not reported due to chromatographic interference
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for



- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by $\geq 40\%$ RPD with no obvious chromatographic interference

Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting